



# **Montana Fish, Wildlife & Parks**

1400 South 19<sup>th</sup> Avenue  
Bozeman, MT 59718

September 21, 2016

To: Governor's Office, Sheena Wilson, State Capitol, Room 204, P.O. Box 200801, Helena, MT 59620-0801  
Environmental Quality Council, State Capitol, Room 106, P.O. Box 201704, Helena, MT 59620-1704  
Dept. of Environmental Quality, Metcalf Building, P.O. Box 200901, Helena, MT 59620-0901  
Dept. of Natural Resources & Conservation, P.O. Box 201601, Helena, MT 59620-1601  
Montana Fish, Wildlife & Parks:

Director's Office	Parks Division	Lands Section	FWP Commissioners
Fisheries Division	Legal Unit	Wildlife Division	Design & Construction

MT Historical Society, State Historic Preservation Office, P.O. Box 201202, Helena, MT 59620-1202  
MT State Parks Association, P.O. Box 699, Billings, MT 59103  
MT State Library, 1515 E. Sixth Ave., P.O. Box 201800, Helena, MT 59620  
James Jensen, Montana Environmental Information Center, P.O. Box 1184, Helena, MT 59624  
Janet Ellis, Montana Audubon Council, P.O. Box 595, Helena, MT 59624  
George Ochenski, P.O. Box 689, Helena, MT 59624  
Jerry DiMarco, P.O. Box 1571, Bozeman, MT 59771  
Montana Wildlife Federation, P.O. Box 1175, Helena, MT 59624  
Wayne Hurst, P.O. Box 728, Libby, MT 59923  
Jack Jones, 3014 Irene St., Butte, MT 59701  
Skyline Sportsmen, PO BOX 173, Butte, MT 59701  
Montana TU, PO Box 7186, Missoula, MT 59807  
George Grant TU, P.O. Box 563, Butte, MT 59702

Ladies and Gentlemen:

Montana Fish, Wildlife & Parks proposes cessation of stocking Rainbow Trout in Hebgen Reservoir in 2017. Trout fisheries in Montana reservoirs are almost entirely maintained by stocking hatchery fish. An exception is Hebgen Reservoir (Figure 1), where in 1983 wild strains of Rainbow Trout were stocked in an effort to develop natural spawning runs in abundant Hebgen Reservoir tributaries (i.e., Grayling Creek, South Fork Madison and Duck Creek). Numerous studies have since determined that indeed natural reproduction in tributaries is sufficient to maintain a Rainbow Trout fishery in Hebgen Reservoir. Many efforts have also been made to evaluate the fate of Rainbow Trout stocked in Hebgen Reservoir over the past 20 years. These studies have repeatedly shown that a majority of the Rainbow Trout in Hebgen Reservoir are derived from wild sources and natural reproduction from the tributaries that feed Hebgen Reservoir - e.g., Grayling, South Fork Madison, and Duck creeks. A definitive look at hatchery contribution of Hebgen Reservoir Rainbow Trout was conducted in 2014. Based on identifiable ratios of chemical elements in tributary streams, hatcheries, and otoliths (inner ear bone) collected from fish in Hebgen Reservoir, approximately 13% of captured fish (angling and nets) were traced back to hatchery

origin. This confirming research suggests that not only is natural reproduction sufficient to sustain the Rainbow Trout fishery in Hebgen Reservoir, but that the fiscally-responsible action from a State agency is to discontinue the stocking program unless future data suggests otherwise. Hebgen Reservoir exhibits characteristics of an oligotrophic system with limited production of food resources for trout. Moreover, annual gill netting has shown that in years where greater than 200,000 subcatchable trout were stocked, populations of Rainbow Trout had 35% fewer fish greater than 16 inches in length (three and four year old fish).

Given the special nature of Hebgen Reservoir, its opportunities for tributary spawning, the confirmed low return to creel and gill nets of hatchery fish, the potential negative impacts from stocking hatchery fish on top of wild trout, and the cost to licensed anglers, Montana Fish, Wildlife & Parks proposes cessation of hatchery stocking and management of Hebgen Reservoir as a wild trout fishery. This management action would be closely monitored to ensure the fishery remains consistent or improves. If declines are observed in the Rainbow Trout fishery, FWP would consider returning to some level of stocking Rainbow Trout in future years.

Montana Fish, Wildlife & Parks is requesting public input and comments on an Environmental Assessment prepared for managing Hebgen Reservoir as a wild trout fishery. The entire EA is available on the Montana Fish, Wildlife & Parks website:

<http://fwp.mt.gov/news/publicNotices/>

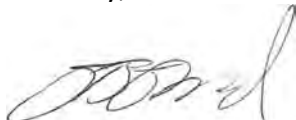
Additionally if requested, MFWP will provide a hard copy of the EA to interested parties. Comments are due by 5:00 pm on November 2, 2016. If you have any written comments regarding the proposed project, please mail them to

Montana Fish, Wildlife & Parks  
c/o Hebgen Wild Trout EA  
1400 S. 19<sup>th</sup> Ave.  
Bozeman, MT 59718  
or e-mail them to Dave Moser ([davemoser@mt.gov](mailto:davemoser@mt.gov))

If you have any questions regarding the proposed project, please call Dave Moser (MFWP, Area Fisheries Biologist) at (406) 994-6938.

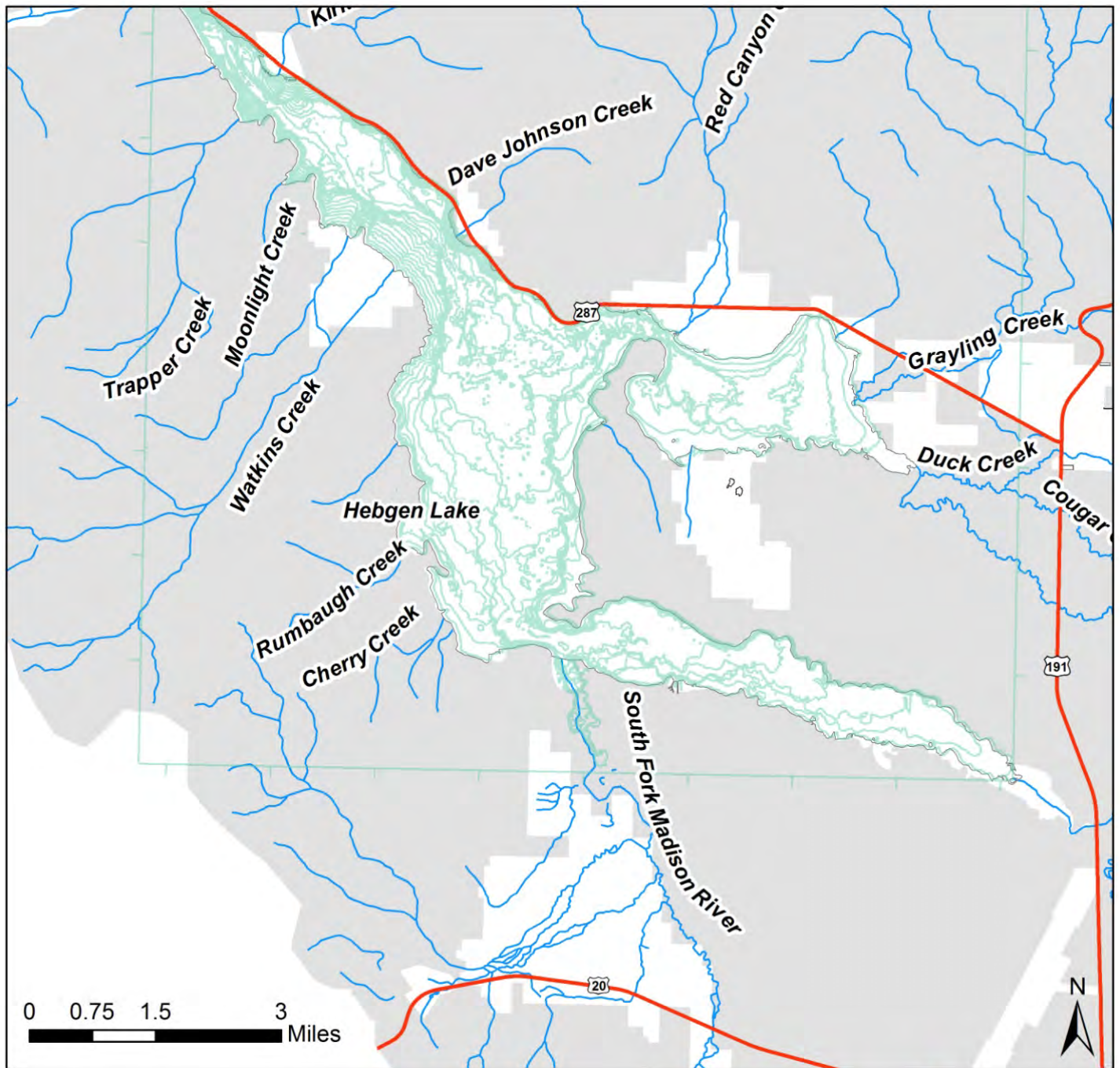
Thank you for your time and consideration of this proposed change in management of Hebgen Reservoir.

Sincerely,



Sam B. Sheppard  
Region 3 Supervisor

Attachment



- Hebgen lake 5 Foot Depth Contours
- Streams
- Private
- National Park Service
- US Forest Service



MONTANA FISH, WILDLIFE & PARKS  
FISHERIES DIVISION

**Management of Hebgen Reservoir and its Tributaries as a Wild Trout Fishery**

**PART I: PROPOSED ACTION DESCRIPTION**

**A. Type of Proposed Action:** The proposed action is to cease stocking of Rainbow Trout in Hebgen Reservoir during 2017 (final stocking in 2016). Many efforts have been made to evaluate success of Rainbow Trout stocking in Hebgen Reservoir over the past 20 years. These studies have repeatedly shown that a majority of the Rainbow Trout in Hebgen Reservoir are derived from wild sources and natural reproduction from the tributaries that feed Hebgen Reservoir - e.g., Grayling, South Fork Madison, and Duck creeks. Past studies using hatchery marks and examination of fin erosion, both error prone tests, suggested that 9% to no more than 20% of the Rainbow Trout in Hebgen Reservoir were from a hatchery origin. A definitive look at hatchery contribution of Hebgen Reservoir Rainbow Trout was conducted in 2014 (Stewart and Duncan 2015). Based on identifiable ratios of chemical elements in tributary streams, hatcheries, and otoliths (inner ear bone) collected from fish in Hebgen Reservoir, approximately 13% of captured fish (angling and nets) were traced back to hatchery origin. This confirming research suggests that not only is natural reproduction sufficient to sustain the Rainbow Trout fishery in Hebgen Reservoir, but that the fiscally-responsible action from a state agency is to discontinue the stocking program unless future data suggests otherwise. Hebgen Reservoir exhibits characteristics of an oligotrophic system with limited production of food resources for trout. Gill netting has shown that years where larger numbers of subcatchable trout were stocked corresponded with 35% fewer fish greater than 16 inches in length after 3 and 4 years.

**B. Agency Authority for the Proposed Action:**

Montana Fish, Wildlife & Parks

Title 87-1-201. Powers and duties. (1) Except as provided in subsection (11), the department shall supervise all the wildlife, fish, game, game and nongame birds, waterfowl, and the game and fur-bearing animals of the state.

Montana ARM Rules 12.7.60

(7) the periodic planting of fish for population manipulation, rather than immediate harvest, is a type of resource management. If such planting is to be continued in a water after a trial period, the following criteria shall be met:

(a) the planted fish after growing to a desirable size for harvest shall have measurably increased some segment of the fish population of the water planted. This is to avoid plants that merely replace wild fish.

(b) the planted fish shall comprise a significant portion of the harvest from that water.

**C. Estimated Commencement Date:** Rainbow trout stocking would be discontinued such that no stocking would occur in 2017 and beyond.

**D. Name and Location of the Project: Management of Hebgen Reservoir and its Tributaries as a Wild Trout Fishery**

Hebgen Reservoir, as defined by the location of its dam, is located approximately 20 miles west of West Yellowstone, Montana. The dam impounds the Madison River approximately 107 miles upstream of the Madison River confluence with the Jefferson River near Three Forks, Montana. The reservoir typically holds over 12,000 acres of water, and the upstream reaches of the reservoir are approximately 5 miles from West Yellowstone, Montana, and Yellowstone National Park. The maximum depth of Hebgen Reservoir is 70 feet. Several major and many minor tributaries feed the reservoir including: Grayling Creek, Duck Creek, Cougar Creek, Madison River, and South Fork Madison River.

**E. Project Size (acres affected)**

Developed/residential – 0 acres

Industrial – 0 acres

Open space/Woodlands/Recreation – 0 acres

Wetlands/Riparian – Hebgen Reservoir is approximately 12,563 acres at full pool.

Floodplain – 0 acres

Irrigated Cropland – 0 acres

Dry Cropland – 0 acres

Forestry – 0 acres

Rangeland – 0 acres

**F. Narrative Summary of the Proposed Action and Purpose of the Proposed Action**

Trout fisheries in Montana reservoirs are almost entirely maintained by stocking hatchery fish. An exception is Hebgen Reservoir (Figure 1), where in 1983 wild strains of Rainbow Trout *Oncorhynchus mykiss* were stocked in an effort to develop natural spawning runs in ample Hebgen Reservoir tributaries. Numerous studies over the past 20 years have assessed tributary production of wild Rainbow Trout in Hebgen Reservoir and identified potential limiting factors.

Watschke (2006) assessed potential for recruitment of wild Rainbow Trout to Hebgen Reservoir. Much of this Environmental Assessment is based on his 2006 study. Numerous other studies have contributed to this document, including work completed by Montana Fish, Wildlife & Parks (FWP), the United States Forest Service, and Northwestern Energy (formerly PPL Montana). Watschke (2006) used a combination of redd surveys, adult, young-of-the-year (YOY; age-0), juvenile (age-1 and age-2) trapping and habitat surveys to assess spawning use and habitat characteristics of 11 tributaries, comprising 170 stream kilometers. A total of 5,642 redds were counted, suggesting the number of spawners was not limiting. Temperature appeared to influence spawning as most production occurred in tributaries with May to July temperatures averaging 8 to 10 °C. The majority (80%) of spawning occurred in two of the 11 tributaries

(Duck Creek and the South Fork of the Madison River). These tributaries contained abundant spawning and rearing habitat. Rainbow Trout Young-of-the-Year (YOY) production estimates exceeded 4.7 million in 2002 and 2003 combined and abundant YOY and age-1 and age-2 juvenile Rainbow Trout were captured during spring and summer outmigrations in these tributaries. Moreover, since timing of spawning (temperature related) is different between tributaries there is a high amount of resiliency/variability – an important factor when weather or climate is unpredictable. Estimates of available spawning and rearing habitat suggest that tributary habitat does not limit the Rainbow Trout population of Hebgen Reservoir from reaching a self-sustaining level that would meet the recreational requirements of the sport fishery.

A definitive look at hatchery contribution to the creel and net was conducted in 2014 (Stewart and Duncan 2015). Based on identifiable ratios of chemical elements in tributary streams, hatcheries, and otoliths (inner ear bone) collected from fish in Hebgen Reservoir, approximately 13% of captured fish (angling and nets) were traced back to hatchery origin.

Hebgen Reservoir is classified as oligotrophic-mesotrophic, meaning low in productivity (Clancey and Lohrenz 2010). Hebgen Reservoir is very limited in food resources needed to support both wild and hatchery stocks. Stocking of fish with little return to the angler is not fiscally responsible for the State of Montana.



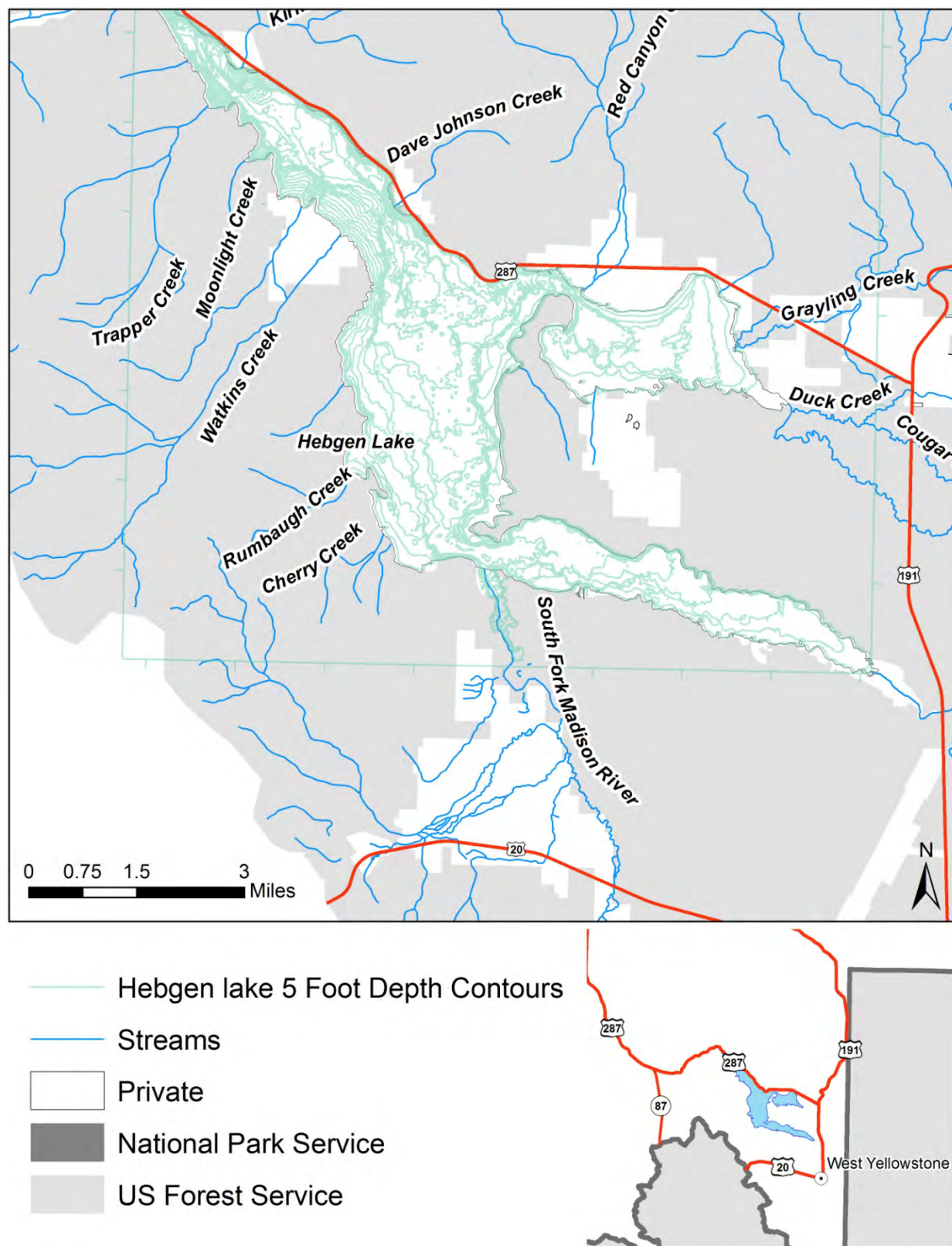


Figure 1. Map of Hebgen Reservoir and Vicinity.

The concept of management of Hebgen Reservoir as a wild trout fishery was first developed informally in 1979 (Files Region 3, Bozeman, MT). Poor recruitment of stocked domesticated strains of trout from 1954 to 1979 led biologists to believe that strains of Rainbow Trout that exhibited wild behavior (i.e., Eagle Lake Strain) and longer life spans could be stocked in Hebgen Reservoir forming naturally reproducing populations in the abundant tributary streams. A focus on enhancing wild adfluvial populations in Hebgen Reservoir has been a management goal for over 35 years. Several studies over the years using tetracycline marks and fin erosion estimated hatchery contribution to be between 9% to 20%. Again, these results were verified and refined by Stewart and Duncan in 2014 when they found that recruitment of stocked trout to nets and angler catch was approximately 13%. The return to creel proportion of hatchery fish was the same as gillnetted fish – an indication that catchability of hatchery fish was the same as wild fish (Stewart and Duncan 2015).

As an example, the estimated cost of raising 100,000 4 inch subcatchable trout in a Montana hatchery is \$2,770 or \$ 0.03 cents a fish. The actual cost of each fish for the angler is dependent on survival and return to creel or net. At a 13% return to creel and net in Hebgen Reservoir each fish costs \$ 0.21 cents. Actual fish caught from a hypothetical 13,000 fish is much less and increases costs per fish dramatically. Wyoming Game and Fish (Wiley et al. 1983) analyzed return rates and costs of raising and transporting subcatchable hatchery trout. Assuming hatchery costs are similar between Wyoming and Montana – and using data from Flaming Gorge Reservoir with a similar 12% return to creel – the cost in current dollars for a **surviving** stocked subcatchable trout in Hebgen Reservoir would be approximately 3 dollars. Communications with Montana Fish, Wildlife & Parks hatchery personnel indicate that these estimated costs are accurate within Montana. (Ryan Derr, Montana Fish, Wildlife & Parks, *personal communication*). Aside from the hatchery-production cost to license paying anglers – stocking may have additional negative impacts on wild stocks of fishes. Numerous studies have shown the negative impacts of stocking hatchery trout over wild trout in streams. Einum and Fleming (2001) completed a meta-analysis (collection and comparison of all literature to date) looking at impacts of hatchery stocking on wild populations. They found that hatchery stocking increased pre-adult aggression, decreased response to predators, and decreased survival. The authors also found instances of decreased growth rates and changes in other fitness related traits such as migration, feeding, and habitat use. The aforementioned meta-analysis included work completed by Vincent (1987) on the Madison River, which effectively ended stocking of hatchery trout in streams in Montana.

Given the special nature of Hebgen Reservoir, its opportunities for tributary spawning, the confirmed low return to creel and gill nets of hatchery fish, and the cost to licensed anglers, FWP proposes cessation of hatchery stocking in Hebgen Reservoir. This management action would be closely monitored to ensure the fishery remains consistent or improves. If declines are observed in the Rainbow Trout fishery, FWP would consider returning to some level of stocking Rainbow Trout in future years.

The State of Montana is required to consider the environmental, social, cultural, and economic effects of proposed actions under the Montana Environmental Policy Act (MEPA) through the development of an environmental assessment (EA). This EA will evaluate of the potential



consequences and impacts of the following of 3 alternatives to manage fish in Hebgen Reservoir and its tributaries. **The 3 alternatives considered are:**

- 1) Cease stocking subcatchable trout in Hebgen Reservoir in 2017 (approximately 100,000 to 200,000 sub-catchable fish). Monitor populations in Hebgen Reservoir using gill nets set at historic locations. Evaluate angler satisfaction through a creel survey in three to four years.
- 2) Reduce stocking in Hebgen Reservoir to a lower level (e.g., 50% or 25% of the current stocking rate). Monitor populations in Hebgen Reservoir using gill nets set at historic locations. Evaluate angler satisfaction through a creel survey in three to four years.
- 3) No action, continue stocking Rainbow Trout annually (approximately 100,000 to 200,000 sub-catchable fish).

Alternative 1 is the preferred alternative. Alternative 2 would be unlikely to improve the fishery in Hebgen Reservoir for several reasons, reduced stocking would make it impossible to evaluate negative impacts of stocking, including, continued competition for resources and unwanted genetic impacts to established wild fisheries. Moreover, return to creel for stocked fish would necessarily be much lower than the current 9 to 13%, with very little benefit to the angler.

## **Proposed Action Background**

Trout management in Montana has changed appreciably over the past 100 years. As in other western states, streams were widely stocked with nonnative trout species beginning around the turn of the 20th century (Behnke 1992). From the 1930s to the 1950s, stocking of subcatchable-size trout was a common management practice, followed by a shift to stocking primarily catchable-size trout from 1955 through 1972 (Vincent 1987). In 1973, the current era of self-sustaining wild trout management began with the cessation of stocking in nearly all streams in the state (Vincent 1987; Montana Outdoors 2004).

The conversion from trout stocking to self-sustaining wild trout fisheries has been a cornerstone of trout management in Montana streams for the past 30 years. The transition to wild trout management occurred largely as a result of studies conducted on the Madison River and O'Dell Creek from 1967 through 1972. This research revealed that stocking of catchable trout had apparently substantial negative effects on wild Brown Trout *Salmo trutta* and Rainbow Trout *Oncorhynchus mykiss* populations (Vincent 1987; Montana Outdoors 2004). Hatchery stocks can have negative effects on wild populations in several ways. The presence of hatchery stocks can lead to hybridization, genetic contamination (affecting locally adapted gene complexes), and increased competition for food and space (Hindar et al. 1991; Krueger and May 1991; Waples 1991). Stocking may also lead to increased predator attraction and disease transmission (White et al. 1995), displacement of wild fish (Mesa 1991; McMichael et al. 1999), and can result in declines in wild populations through competition for spawning and rearing habitat (Kostow et al. 2003). In addition, survival rates and, hence, cost effectiveness of stocking programs can vary widely and can generate further demand, resulting in increased public dependence on hatchery trout (Wiley et al. 1993).

In contrast, trout stocking can be a very effective management tool in lakes and reservoirs where reproduction is limited. Stocking can redirect and absorb consumptive effort, by decreasing fishing pressure on wild populations, and can help garner support for habitat management and wild trout policies in streams (Van Vooren 1995). However, an analysis of otoliths from both creel and gill net in Hebgen Reservoir showed no difference in catchability between wild fish and hatchery fish, negating any fishing pressure release on natural stocks of Rainbow Trout. (Stewart and Duncan 2015). Fisheries management of Montana lakes and reservoirs is based on maintaining wild fish populations where natural spawning occurs (FWP 1986). However, many Montana lakes and reservoirs have little wild trout recruitment because of inadequate spawning or rearing habitat, and are supplemented with hatchery-reared fish to maintain recreational fisheries (FWP 1986). Over half (11 of 18) of the large (1,200 ha and larger) reservoirs in Montana were stocked in 2003 (R. McFarland, Systems Analyst, Montana Department of Fish, Wildlife and Parks (FWP), personal communication; FWP 2004a). For example, one of the most valuable and popular recreational trout fisheries in the state of Montana, Canyon Ferry Reservoir of the Missouri River system, relies on annual stocking of Rainbow Trout to maintain a quality fishery because of a lack of tributary spawning habitat (McMahon 1992; FWP 2000).

Hebgen Reservoir in southwest Montana, appears unique among many reservoirs because of the presence of 10 high-quality spawning and rearing tributaries. Hebgen Reservoir has a good

quality Brown Trout fishery, established in the 1930s, that has been self-sustaining since the last Brown Trout hatchery stocking in 1956 (Hetrick 1994a).

Several strains of Rainbow and Cutthroat trout have been stocked since the establishment of the Hebgen Reservoir fishery. The Montana Fish, Wildlife and Parks stocked catchable and subcatchable Rainbow Trout, primarily Arlee and Shasta strains, in Hebgen Reservoir from 1954-1979 (ERI and NWPS 2002). In most years, however, these hatchery stocks experienced poor survival, slow growth rates, and poor catch rates. As a result – in 1983 FWP began stocking wild strains of Rainbow Trout (i.e. Eagle Lake and DeSmet; Table 1).

Eagle Lake fish are known to naturally run long distances up tributaries from Eagle Lake California to spawn. Since 1983, spawning runs have been monitored in many of the tributaries to Hebgen Reservoir (Hetrick 1993; Lohrenz 2006; Watschke 2006). Two primary tributaries Duck Creek and South Fork of the Madison River account for approximately 80% of tributary production and recruitment to Hebgen Reservoir. Watschke (2006) estimated YOY production estimates for the Hebgen Basin exceeded 4.7 million in 2002 and 2003. Montana Fish, Wildlife & Parks stocks approximately 100,000 to 200,000 hatchery sub-adults every year in Hebgen Reservoir. Hatchery contribution to Hebgen Reservoir is clearly minimal and may be depressing natural reproduction through competitive interactions and outbreeding (breakdown of coadapted gene complexes).

The intent of stocking wild-strain Eagle Lake trout was to build a population that would reproduce naturally, thereby providing ample recruitment to sustain a productive fishery without the dependence and expense associated with annual stocking (Hetrick 1994b). Wild-strain McBride Yellowstone cutthroat trout (YCT) were stocked from 1979 through 1986. The McBride YCT had high survival rates, but did not establish significant spawning runs in Hebgen Reservoir tributaries (Hetrick 1993a). Supplementation shifted to two wild strains of Rainbow Trout in 1983 - Eagle Lake and DeSmet (FWP 2004a). The system has been stocked annually with 100,000 to 200,000 Eagle Lake or Harrison Lake (Desmet Rainbow Trout) fingerlings in recent years (1996 through 2015; Table 1). A strain analysis was conducted in 2009 (Robb Leary, letter dated June 23, 2009). The genetic admixture of wild fish was revealed to be primarily Eagle Lake strain with a significant Kamloops contribution. Approximately 2,000 Kamloops strain Rainbow Trout were stocked in 1988. It is unknown whether these 2,000 fish were responsible for a significant genetic contribution to the fishery or Kamloops were stocked prior to accurate recordkeeping in prior to 1973.

From 1983 to 2005 Hebgen Reservoir annual spring gill net surveys showed wide fluctuations in Rainbow Trout abundances (Figure 2). Since 2005, gill net catch rates have been more predictable. In 1987 and 1988 over ½ million fish were stocked in Hebgen Reservoir. The result of this much increased fish stocking was in some years higher numbers of fish per net gill net set, but also resulted in a 35% decrease in larger fish 16 to 19 inches in length with a concomitant increase in numbers of fish less than 15 inches (Figure 2 and 3). In years where greater numbers of subcatchable rainbow trout were stocked, relative size of Rainbow Trout decreased substantially (1993-1995, 2008) Hebgen Reservoir productivity has been monitored for many years and remains limited in its ability to provide food for fishes (Travis Lohrenz, Montana Fish, Wildlife & Parks, *personal communication*). The development of natural reproduction in

## Management of Hebgen Reservoir as a Wild Trout Fishery

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multiple tributaries to Hebgen has likely reached a point where the Rainbow Trout fishery is much more stable/resilient and at carrying capacity. Wild stocks of Eagle Lake/Kamloops strain appear to be providing ample recruitment and catchable fish greater than 16 inches in length (Figures 2 and 3).

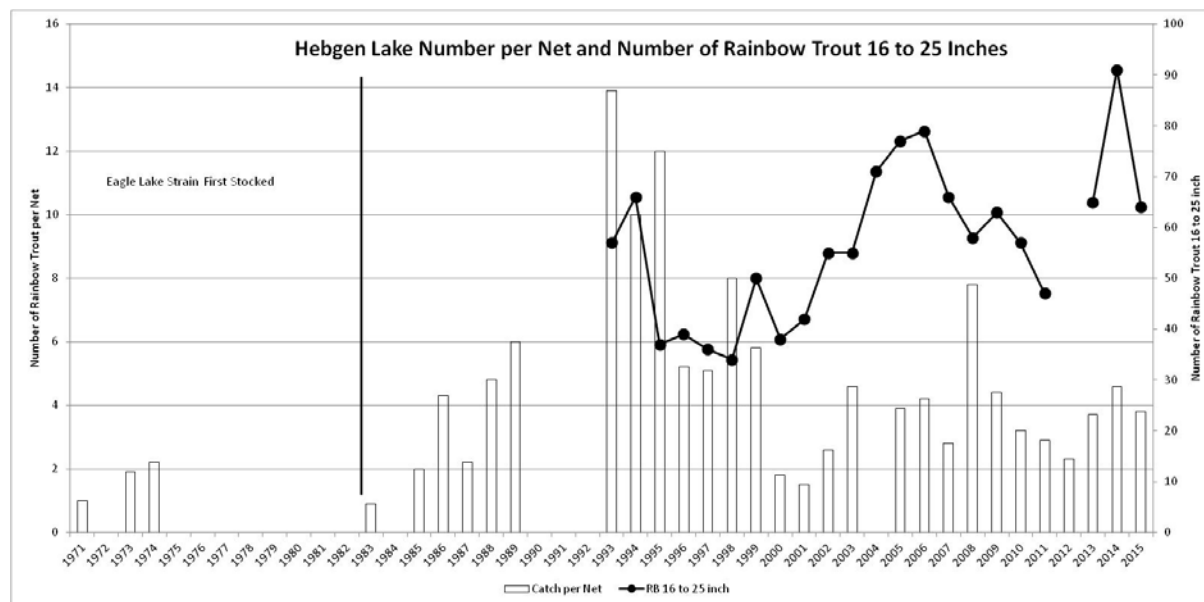


Figure 2. Hebgen Reservoir spring surface gill net catch rates (average number of fish per floating net night) for Rainbow Trout from 1971 through 2015. Blanks on years indicate no data or full moon sets hindered collections. Numbers of Rainbow Trout greater than 16 inches.

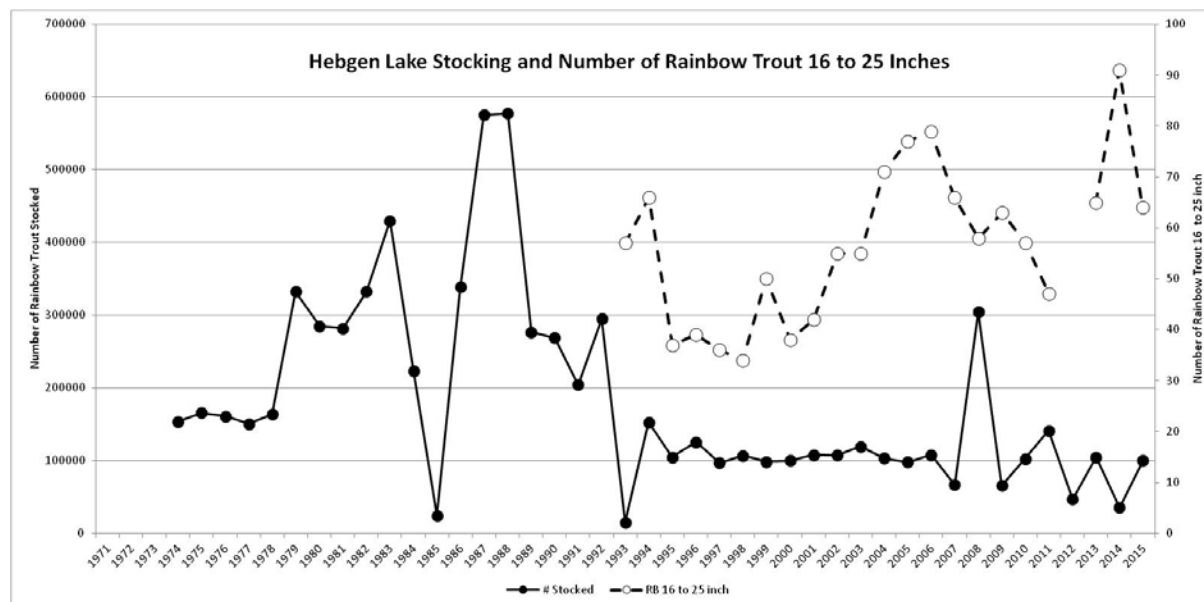



Figure 3. Hebgen Reservoir spring relative stock density of Rainbow Trout 16 to 25 inches (1992 to 2015) and numbers of Rainbow Trout stocked, 1971 to 2015.

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Table 1. Stocking records for different strains of Rainbow Trout in Hebgen Reservoir. The Harrison Lake strain is a descendent of the DeSmet strain of Rainbow Trout. Some additional Harrison Lake derived fish were stocked in some years by Ennis National Fish Hatchery.

Years	 DeSmet	Eagle Lake	Fish Lake	Gerrard	Harrison Lake	Kamloops	McConaughy	Grand Total
1983		66049					363970	430019
1984		69972					153396	223368
1985							24613	24613
1986	100000	162203					76332	338535
1987	350995	123152					101095	575242
1988	357795	217380				2000		577175
1989	276457							276457
1990	268910							268910
1991	204118							204118
1992	274755	19900						294655
1993		15012						15012
1994	105502	46851						152353
1995	55315	49537						104852
1996		125449						125449
1997		96653						96653
1998		106861						106861
1999		98288						98288
2000		100144						100144
2001		107620						107620
2002		107509						107509
2003		119195						119195
2004		103276						103276
2005		97998						97998
2006		107828						107828
2007		66572						66572
2008		71721	51712		180796			304229
2009		65734						65734
2010					102791			102791
2011					141080			141080
2012					46780			46780
2013					104835			104835
2014					35235			35235
2015				24818	75252			100070
<b>Grand Total</b>	<b>1993847</b>	<b>2144904</b>	<b>51712</b>	<b>24818</b>	<b>686769</b>	<b>2000</b>	<b>719406</b>	<b>5623456</b>

In summary, Hebgen Reservoir tributaries are not limited in available spawning or rearing habitat. Wild reproduction (80%) was concentrated in two tributaries, Duck Creek and the South Fork of the Madison River. These tributaries had a unique combination of a high quantity of rearing habitat in the form of deep pools and beaver ponds, an abundance of spawning gravels, and water temperatures throughout the upstream migration and spawning period of 46 to 50 °F. Tributaries that had only one or two of these characteristics had many fewer redds but should provide complexity and resiliency to wild populations.

One variable that may suppress overall recruitment of Rainbow Trout is the presence of a wild population of Brown Trout. Predation by Brown Trout is likely self limiting with opportunities for prey switching (i.e., Utah Chub). Brown Trout may suppress wild juvenile Rainbow Trout in tributaries. However there is no evidence that Brown Trout rely on or selectively prey on hatchery stocked Rainbow Trout in Hebgen Reservoir. Over several years in the 1990's gut



analysis of Hebgen Brown Trout indicated that primary food sources were invertebrates, Mountain Whitefish and Utah Chubs (Jody Hupka, *personal communication*)

The Rainbow Trout population in Hebgen Reservoir is functionally already a wild trout fishery (Stewart and Duncan 2015) with little hatchery contribution to the population. Evidence from the literature is rife with instances of negative impacts to wild populations of trout by fish of hatchery origin (Einum and Fleming 2001). Given the low return to creel and net, there is no viable reason to continue stocking hatchery fish in Hebgen Reservoir.

Finally, costs associated with stocking Rainbow Trout in Hebgen Reservoir in light of the aforementioned evidence makes no sense fiscally for the State of Montana and its license holders.

### **Goals of Proposed Action**

The primary goal of the proposed action is to maintain Hebgen Reservoir as a wild trout fishery. Positive impacts to the fishery and the public include:

- Maintain the current opportunity to catch wild trout that have spawned naturally, a cornerstone of wild trout management in streams since the early 1970's.
- Maintain numbers of Rainbow Trout and Brown Trout in Hebgen Reservoir, monitor with gill netting and creel surveys.
- Potentially increase average size of Rainbow Trout in Hebgen Reservoir through reduced competition for space and food.
- Promote natural spawning migration through elimination of hatchery selected fish, or fish obtained from sources other than Hebgen Reservoir.
- Reduce costs associated with propagation of hatchery stocks that return to creel at very low rates.

### **Relevant Plans**

Management plans and documents related to maintaining Hebgen Reservoir as a wild trout fishery (Table 2). These documents describe management goals and research related to stocking of Rainbow Trout in Hebgen Reservoir.

Table 2. Research reports and management plans associate with hatchery stocking and wild recruitment in Hebgen Reservoir.

Author(s)	Title
Montana State University	Contribution of Stocked Rainbow Trout to the Hebgen Reservoir Fishery (2015)
FWP	Montana's statewide fisheries management plan (2014)
USFS	Gallatin National Forest, 2006 Accomplishment Report to PPL Montana

## Management of Hebgen Reservoir as a Wild Trout Fishery

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Montana State University, Darin Watschke	Assessment of Tributary Potential for Wild Trout Recruitment in Hebgen Reservoir, Montana (2006) MS Thesis
FWP	Hebgen Basin Interagency Fisheries Working Group Accomplishment Report to PPL Montana (2006)
University of Montana	Genetic Strain Analysis of Hebgen Reservoir Tributary Fishes (1996)
FWP	Hebgen Reservoir Creel Survey and Contribution of Stocked Trout to the Recreational Fishery: June 2000 to June 2001 (2004)
FWP	Hebgen Reservoir Fry Recruitment Study, Final Report (1991)
University of Montana	Genetic Strain Analysis of Hebgen Reservoir Tributary Fishes (1996)

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**PART II. ENVIRONMENTAL REVIEW CHECKLIST**

Montana Fish, Wildlife & Parks (FWP)  
1400 South 19th Avenue, Bozeman MT, 59718

**Draft Environmental Assessment**

**Management of Hebgen Reservoir and its Tributaries as a Wild Trout Fishery**

Evaluation of the impacts of the Proposed Action including secondary and cumulative impacts on the Physical and Human Environment.

**A. PHYSICAL ENVIRONMENT**

1. <b><u>LAND RESOURCES</u></b>  Will the proposed action result in:	IMPACT					
	Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Soil instability or changes in geologic substructure?		X				
b. Disruption, displacement, erosion, compaction, moisture loss, or over-covering of soil, which would reduce productivity or fertility?		X				
c. Destruction, covering or modification of any unique geologic or physical features?		X				
d. Changes in siltation, deposition or erosion patterns that may modify the channel of a river or stream or the bed or shore of a lake?		X				
e. Exposure of people or property to earthquakes, landslides, ground failure, or other natural hazard?		X				

2. <b><u>AIR</u></b>  Will the proposed action result in:	IMPACT *					
	Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Emission of air pollutants or deterioration of ambient air quality? (Also see 13 (c).)		X				
b. Creation of objectionable odors?		X				
c. Alteration of air movement, moisture, or temperature patterns or any change in climate, either locally or regionally?		X				
d. Adverse effects on vegetation, including crops, due to increased emissions of pollutants?		X				
e. For P-R/D-J projects, will the project result in any		X				

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discharge, which will conflict with federal or state air quality regulations? (Also see 2a.)						
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3. <u>WATER</u>  Will the proposed action result in:	IMPACT					
	Unkno wn	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Discharge into surface water or any alteration of surface water quality including but not limited to temperature, dissolved oxygen or turbidity?		X				
b. Changes in drainage patterns or the rate and amount of surface runoff?		X				
c. Alteration of the course or magnitude of floodwater or other flows?		X				
d. Changes in the amount of surface water in any water body or creation of a new water body?		X				
e. Exposure of people or property to water related hazards such as flooding?		X				
f. Changes in the quality of groundwater?		X				
g. Changes in the quantity of groundwater?		X				
h. Increase in risk of contamination of surface or groundwater?		X				
i. Effects on any existing water right or reservation?		X				
j. Effects on other water users as a result of any alteration in surface or groundwater quality?		X				
k. Effects on other users as a result of any alteration in surface or groundwater quantity?		X				
l. For P-R/D-J, will the project affect a designated floodplain? (Also see 3c.)		X				
m. For P-R/D-J, will the project result in any discharge that will affect federal or state water quality regulations? (Also see 3a.)		X				



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4. <b><u>VEGETATION</u></b>  Will the proposed action result in?	<b>IMPACT</b>					
	Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Changes in the diversity, productivity or abundance of plant species (including trees, shrubs, grass, crops, and aquatic plants)?		X				
b. Alteration of a plant community?		X				
c. Adverse effects on any unique, rare, threatened, or endangered species?		X				
d. Reduction in acreage or productivity of any agricultural land?		X				
e. Establishment or spread of noxious weeds?		X				
f. For P-R/D-J, will the project affect wetlands, or prime and unique farmland?		X				
g. Other:		X				

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5. <b><u>FISH/WILDLIFE</u></b>  Will the proposed action result in:	IMPACT					
	Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Deterioration of critical fish or wildlife habitat?		X				
b. Changes in the diversity or abundance of game animals or bird species?			X			5b.
c. Changes in the diversity or abundance of nongame species?			X			5c.
d. Introduction of new species into an area?		X				
e. Creation of a barrier to the migration or movement of animals?		X				
f. Adverse effects on any unique, rare, threatened, or endangered species?		X				
g. Increase in conditions that stress wildlife populations or limit abundance (including harassment, legal or illegal harvest or other human activity)?		X				
h. For P-R/D-J, will the project be performed in any area in which T&E species are present, and will the project affect any T&E species or their habitat? (Also see 5f.)		X				
i. For P-R/D-J, will the project introduce or export any species not presently or historically occurring in the receiving location? (Also see 5d.)		X				

5b. The proposed action would eliminate hatchery sources of fish. A definitive analysis of wild vs. hatchery origin fish using otolith microchemistry (Stewart and Duncan; 2014) revealed 13% of Rainbow Trout in Hebgen Reservoir were of hatchery origin. The remainder of the Hebgen Reservoir Rainbow trout fishery is primarily sourced from wild reproduction in tributaries. Watschke (2006) identified an ample amount of reproduction and rearing habitat in Hebgen Reservoir tributaries. Stocked fish have proven in numerous studies to limit wild reproduction through competition for resources and space. The wild Hebgen Reservoir Rainbow Trout fishery has the capability to provide for recreational use, harvest, and natural biotic processes. Negative impacts from continued introduction of hatchery or other origin (Harrison Lake) fish may also be genetically impacting natural stocks of Rainbow Trout in Hebgen Reservoir.

5c. In the absence of all other variables, reduction of stocking could potentially reduce numbers of Rainbow Trout by approximately 13% - this would represent approximately 1/2 of one fish in a daily limit of 5 fish for those harvesting trout. Because Hebgen Reservoir is limited in food resources for subcatchable trout (i.e., planktonic food), Montana Fish, Wildlife & Parks anticipates that a slight decrease in the total number of fish available for harvest could also result in more larger, trophy size Rainbow Trout greater than 20 inches. Creel surveys and continued gill netting would provide information on future catch rates, size of fish caught, and population health in Hebgen Reservoir. Alternatively, impacts to wild Rainbow Trout from hatchery reared trout could be eliminated and may result in no decrease in numbers of fish or an increase in density of Rainbow Trout. However, it may take several years for the fishery to reach a natural equilibrium.

**B. HUMAN ENVIRONMENT**

<b>6. <u>NOISE/ELECTRICAL EFFECTS</u></b>  <b>Will the proposed action result in:</b>	<b>IMPACT</b>					
	<b>Unknown</b>	<b>None</b>	<b>Minor</b>	<b>Potentially Significant</b>	<b>Can Impact Be Mitigated</b>	<b>Comment Index</b>
a. Increases in existing noise levels?		X				
b. Exposure of people to serve or nuisance noise levels?		X				
c. Creation of electrostatic or electromagnetic effects that could be detrimental to human health or property?		X				
d. Interference with radio or television reception and operation?		X				

<b>7. <u>LAND USE</u></b>  <b>Will the proposed action result in:</b>	<b>IMPACT</b>					
	<b>Unknown</b>	<b>None</b>	<b>Minor</b>	<b>Potentially Significant</b>	<b>Can Impact Be Mitigated</b>	<b>Comment Index</b>
a. Alteration of or interference with the productivity or profitability of the existing land use of an area?		X				7a.
b. Conflicted with a designated natural area or area of unusual scientific or educational importance?		X				
c. Conflict with any existing land use whose presence would constrain or potentially prohibit the proposed action?		X				
d. Adverse effects on or relocation of residences?		X				

7a. The preferred alternative of cessation of stocking should not have any impact on the fishing industry connected to the Hebgen Reservoir fishery. Should cessation of stocking result in larger, trophy sized trout, there is potential for increases in interest in fishing a purely wild trout fishery in Hebgen Reservoir. Stocking or not stocking fish is based on analysis and interpretation of sampling data and analysis and interpretation of creel surveys. Given the preponderance of evidence that cessation of stocking will have negligible (or positive effects) on the Hebgen Reservoir fishery – the proposed action is the only alternative that makes State fiscal sense and adheres to the long-term goal of wild fish management while maintaining a viable recreational fishery.

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8. <u>RISK/HEALTH HAZARDS</u>  Will the proposed action result in:	IMPACT					
	Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Risk of an explosion or release of hazardous substances (including, but not limited to oil, pesticides, chemicals, or radiation) in the event of an accident or other forms of disruption?		X				
b. Affect an existing emergency response or emergency evacuation plan, or create a need for a new plan?		X				
c. Creation of any human health hazard or potential hazard?		X				
d. For P-R/D-J, will any chemical toxicants be used? (Also see 8a)		X				

9. <u>COMMUNITY IMPACT</u>  Will the proposed action result in:	IMPACT					
	Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Alteration of the location, distribution, density, or growth rate of the human population of an area?		X				9a.
b. Alteration of the social structure of a community?		X				9b.
c. Alteration of the level or distribution of employment or community or personal income?		X				9c.
d. Changes in industrial or commercial activity?		X				9d.
e. Increased traffic hazards or effects on existing transportation facilities or patterns of movement of people and goods?		X				

9 a-d. The fisheries of Hebgen Reservoir have historically been very popular with the angling public. Because Hebgen Reservoir is not a biologically productive system and has ample tributaries available for spawning; an effort was made in the early 1980's to introduce wild strains of trout and allow a naturally reproducing population of Rainbow Trout to thrive. Past and recent data indicate that the fishery is currently self sustaining with good numbers of quality fish (16 inch +). Stocking efforts provide a small percentage of fish for harvest or angling capture. Montana Fish, Wildlife & Parks anticipates that cessation of stocking will have negligible impacts on total fish numbers in Hebgen Reservoir. Moreover, Montana Fish, Wildlife & Parks expects that cessation of stocking may produce a more robust natural fishery with a larger trophy component in the absence of hatchery stocking. Should it be necessary, stocking could be resumed in Hebgen Reservoir.

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10. <u>PUBLIC SERVICES/TAXES/UTILITIES</u>  Will the proposed action result in:	IMPACT					
	Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Will the proposed action have an effect upon or result in a need for new or altered governmental services in any of the following areas: fire or police protection, schools, parks/recreational facilities, roads or other public maintenance, water supply, sewer or septic systems, solid waste disposal, health, or other governmental services? If any, specify:		X				
b. Will the proposed action have an effect upon the local or state tax base and revenues?		X				
c. Will the proposed action result in a need for new facilities or substantial alterations of any of the following utilities: electric power, natural gas, other fuel supply or distribution systems, or communications?		X				
d. Will the proposed action result in increased use of any energy source?		X				
e. Define projected revenue sources		X				
f. Define projected maintenance costs.		X				10f.

10f. Since 1981 (Table 1) approximately 7 million Rainbow Trout (State hatcheries and Ennis National Fish Hatchery combined) have been stocked in Hebgen Reservoir – at a cost of \$210,000 in today's dollars. These costs adjusted by a hypothetical 13% return to creel or 910,000 fish would be conservatively \$1,610,000

From June 2000 to June 2001 (Byorth 2004) estimated approximately 65,000 angler hours. At an average catch rate of 0.31 fish per hour, a total of 20,000 fish were caught during the census period. Ten percent of all the fish caught would be of hatchery origin – approximately 2,000 fish. Assuming that anglers caught from three years of age classes, those 2,000 fish came from three years of stocking or 600,000 fish. The data suggests that during this time period every hatchery catch could represent \$4.50 of Montana Fish, Wildlife & Parks angler dollars.

FWP suggest that even if catch rates decrease by 10% with cessation of stocking, anglers who are harvesting Rainbow Trout would catch one less fish over a two day 10 fish in possession limit. Anglers could of course theoretically angle for an extra three hours to catch one more fish (assuming 0.31 fish/hour catch rate).

Given that approximately 87% of the Rainbow Trout population is of natural origin and the costs of stocking it makes no sense biologically or fiscally to continue supplementing Hebgen Reservoir.



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11. <u>AESTHETICS/RECREATION</u> Will the proposed action result in:	IMPACT					
	Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Alteration of any scenic vista or creation of an aesthetically offensive site or effect that is open to public view?		X				
b. Alteration of the aesthetic character of a community or neighborhood?		X				
c. Alteration of the quality or quantity of recreational/tourism opportunities and settings? (Attach Tourism Report.)		X				11c.
d. <u>For P-R/D-J</u> , will any designated or proposed wild or scenic rivers, trails or wilderness areas be impacted? (Also see 11a, 11c.)		X				

Hebgen Reservoir is unique in many ways; it is an aesthetically beautiful reservoir with ample access for camping, fishing, and other recreational opportunities. Montana is unique in its efforts to manage wild trout fisheries. Should the proposed alternative be implemented – Hebgen Reservoir would be one of the largest and most popular reservoir fisheries in the world that is not reliant on hatchery raised fish.

12. <u>CULTURAL/HISTORICAL RESOURCES</u> Will the proposed action result in:	IMPACT					
	Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Destruction or alteration of any site, structure or object of prehistoric historic, or paleontological importance?		X				
b. Physical change that would affect unique cultural values?		X				
c. Effects on existing religious or sacred uses of a site or area?		X				
d. <u>For P-R/D-J</u> , will the project affect historic or cultural resources? Attach SHPO letter of clearance. (Also see 12.a.)		X				

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## SIGNIFICANCE CRITERIA

13. <u>SUMMARY EVALUATION OF SIGNIFICANCE</u>  Will the proposed action, considered as a whole:	IMPACT					
	Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Have impacts that are individually limited, but cumulatively considerable? (A project or program may result in impacts on two or more separate resources that create a significant effect when considered together or in total.)		X				
b. Involve potential risks or adverse effects, which are uncertain but extremely hazardous if they were to occur?		X				
c. Potentially conflict with the substantive requirements of any local, state, or federal law, regulation, standard or formal plan?		X				
d. Establish a precedent or likelihood that future actions with significant environmental impacts will be proposed?		X				
e. Generate substantial debate or controversy about the nature of the impacts that would be created?			X			13e
f. For P-R/D-J, is the project expected to have organized opposition or generate substantial public controversy? (Also see 13e.)		X				
g. For P-R/D-J, list any federal or state permits required.		X				

13e. Montana Fish, Wildlife & Parks understands that there may be some concern from local or out of state businesses or anglers that cessation of stocking will impact the fishery. Montana Fish, Wildlife & Parks plans on holding a meeting in West Yellowstone, Montana to discuss this plan and reasoning behind this management direction. Hebgen Reservoir has been stocked with numerous species, strains, and numbers of fish for 100 years. It is clear from recent studies and over 40 years of data collection that Hebgen is uniquely able to provide a wild trout fishery that benefits the public. Should the proposed alternative impact anglers in a negative way, or data indicates that stocking is actually necessary; stocking can be resumed. Given that 87% of hatchery stocked fish do not survive in Hebgen Reservoir, it makes little sense at this time to incur costs associated with stocking with the added potential negative impacts to the wild fishery.

### **PART III. NARRATIVE EVALUATION AND COMMENT**

Typically stocking of reservoirs and lakes in Montana does not require Montana Environmental Protection Act consideration. However, because of the popularity, size, and importance of Hebgen Reservoir and its tributaries Montana Fish, Wildlife & Parks has decided to vet the proposed action of cessation of stocking and other alternatives with the public. FWP does wish to present the latest biological information and decision making process to the public and listen to concerns or potential variables that the public can provide.

### **PART IV. PUBLIC PARTICIPATION**

1. Public involvement:

The public will be notified in the following manners to comment on this current EA, the proposed action and alternatives:

- Public notices in each of these papers: The West Yellowstone Star, the Madisonian, and the Bozeman Daily Chronicle
- One statewide press release
- One public meeting in West Yellowstone, MT.
- Public notice on the Fish, Wildlife & Parks web page: <http://fwp.mt.gov>.

**Copies of this environmental assessment will be distributed to the neighboring landowners and interested parties to ensure their knowledge of the proposed project.**

**This level of public notice and participation is novel but appropriate for a fishery of this size and popularity. This EA and public discussion serves as a valuable management tool/plan.**

2. Duration of comment period:

The public comment period will extend for (30) thirty days following the publication of the second legal notice in area newspapers. Written comments will be accepted until 5:00 p.m., November 2, 2016 and can be mailed or e-mailed to the address below:

Dave Moser  
Montana Fish, Wildlife & Parks  
1400 South 19th Avenue, Bozeman MT, 59718

davemoser@mt.gov

### **PART V. EA PREPARATION**

1. Based on the significance criteria evaluated in this EA Montana Fish, Wildlife & Parks concludes that the management of trout stocking in Hebgen reservoir does not warrant an Environmental Impact Statement (EIS). Montana Fish, Wildlife & Parks expects the proposed action will have no impact on the general environment of Hebgen Reservoir

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and its tributaries and furthermore may have a positive impact on the population structure and Rainbow Trout fishery in Hebgen Reservoir and its tributaries.

2. Person(s) responsible for preparing the EA:

David Moser, Fisheries Biologist  
Region 3 Headquarters – Montana Fish, Wildlife & Parks  
1400 South 19<sup>th</sup> Avenue  
Bozeman, MT 59718

(406) 994-6938  
davemoser@mt.gov

3. List of agencies or offices consulted during preparation of the EA:

United States Forest Service  
Northwestern Energy  
Montana FWP Legal Division  
Montana FWP Hatchery Bureau  
Montana FWP Fisheries Division